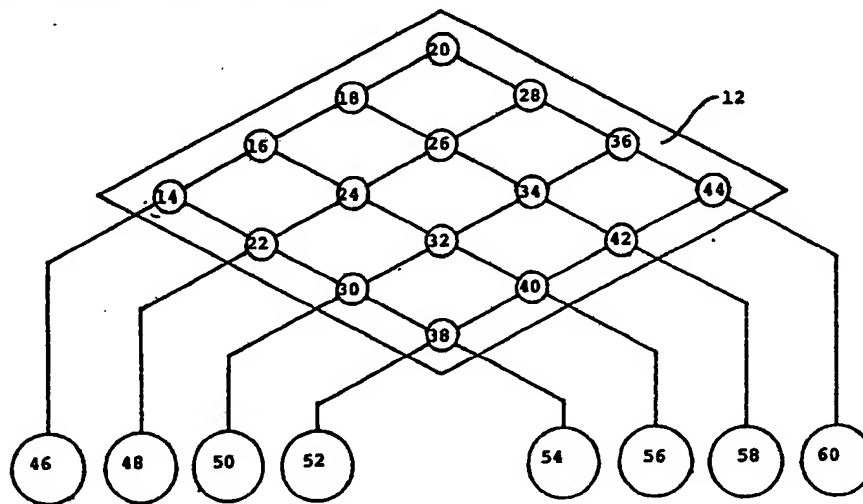




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<b>(21) International Application Number:</b> PCT/SE88/00425 <b>(22) International Filing Date:</b> 19 August 1988 (19.08.88)  <b>(31) Priority Application Number:</b> 8703293-4 <b>(32) Priority Date:</b> 25 August 1987 (25.08.87) <b>(33) Priority Country:</b> SE  <b>(71) Applicant (for all designated States except US):</b> S B MARKETING AB [SE/SE]; Eskadervägen 18, S-183 54 Täby (SE).  <b>(72) Inventor; and</b> <b>(75) Inventor/Applicant (for US only) :</b> YLINEN, Klaus [SE/ SE]; Celsiusgatan 1, S-112 30 Stockholm (SE).  <b>(74) Agent:</b> SEDVALL, Bengt; Box 7182, S-103 88 Stock- holm (SE).		<b>(81) Designated States:</b> AT (European patent), AU, BE (Eu- ropean patent), CH (European patent), DE (Euro- pean patent), DK, FI, FR (European patent), GB (European patent), IT (European patent), LU (Euro- pean patent), NL (European patent), NO, SE (Euro- pean patent), US.  <b>Published</b> <i>With international search report.</i> <i>In English translation (filed in Swedish).</i>

**(54) Title:** DEVICE FOR TESTING REACTION TIME**(57) Abstract**

Apparatus for testing or measuring the reaction time of a person includes test devices (14-44) the presentation state of which is intended to change randomly. Connected to the test devices are operating means (46-60) which are intended to be activated by the test person when the test devices are switched to a predetermined state to which the person is intended to react. Connected to the operating devices are measuring and indicating means for measuring the reaction time and indicating this reaction time, for instance, a scale. The apparatus includes a plurality of test devices (14-44), e.g. in the form of light nodes which are ignited and extinguished randomly, and each test device is connected to at least two operating means (46-60). The connection is such that those operating means which are connected to the test device which presents the predetermined state must be activated simultaneously in order to activate the measuring and indicating devices (62).

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Device for testing reaction time.

The present invention relates to apparatus for testing or measuring the reaction rate of a person and comprising reaction promoting devices the presentation state of which will change at random; operating means for activation by said person upon the occurrence of a change of state to which said person is intended to react; and reaction time measuring and indicating means connected to the operating means.

Apparatus intended for measuring human reaction times are known to the art. Examples of such apparatus include coin operated machines with which a person is expected to react as quickly as possible to an acoustic or visual signal produced by the machine, by carrying out some specific action, e.g. by pressing a button. The length of time which lapses from the moment at which the signal occurs to the moment at which the button is pressed constitutes the reaction time. Such machines may be found, for instance, in hotels, restaurants and other public places, and the test presented will often be one which is intended to illustrate the speed at which a person will react in a road traffic situation.

For instance, in DOS 25 42 662 there is described and illustrated a reaction testing arrangement in which a delay mechanism is activated by the pressing of a button and which will cause a lamp to be illuminated after an arbitrarily selected length of time has lapsed from the moment that the button was pressed. Simultaneously herewith, an indicator is caused to move, this indicator movement being stopped by re-pressing the button. The time taken for the person to react is shown on a reaction speed scale.

This kind of automatic reaction tester, however, will not simulate conditions and situations prevailing, for instan-

ce, in road traffic, since such testing apparatus only require the test person to react to a single happening, such as to re-press a button, whereas traffic situations often necessitate two or more maneuvers to be made simultaneously.

The main object of the present invention is to provide apparatus of the kind disclosed in the introduction with which the reaction ability of a person can be tested under simulated situations which correspond more realistically to those situations likely to occur, e.g., in road traffic, and with which the situation or condition to which the person shall react is presented in a more complex manner and requires the application of several measures or manipulations in order to manage this situation.

This object is achieved with an inventive apparatus having the characterizing features set forth in the following claims.

The invention will now be described in more detail with reference to a preferred exemplifying embodiment thereof illustrated in the accompanying schematic drawings, of which Figure 1 is a plan view of the inventive apparatus and illustrates the arrangement of component parts thereof; and Figure 2 illustrates the actual test plane of the apparatus.

In Figures 1 and 2, the reference 10 identifies an apparatus table on which there is mounted a test plane or surface. The test plane includes reaction promoting devices, such as a plurality of light nodes or lamps, in the illustrated embodiment sixteen lamps, 14-44, which are spaced evenly in a rhombic field 12, such as to form diamond patterns comprising four times four lamps. The lamps 14-44 are interconnected mutually by electric conductors or circuits,

which connect rectilinearly the group of lamps with four lamps in each group. The two conductor networks thus formed will intersect one another at the angle shown in Figure 2.

5 Located beneath the field of the test plane is an operating panel which includes a plurality of operating buttons designated 46-60, in the illustrated case eight buttons; which are arranged in two groups, with four buttons 46-52  
10 and 54-60 in each group. Each operating button 46-60 of respective groups is connected with one of the mutually intersecting conductors or circuits which connects the lamps 14-44, as before described. Consequently, each light node or lamp 14-44 will be electrically connected simulta-  
15 46-52 and 54-60, therewith enabling two operating buttons to be manipulated simultaneously, in the manner hereinafter described.

As will be seen from Figure 1, arranged above the test  
20 plane 12 is a measuring and indicating device in the form of a scale 62, which indicates the reaction time, e.g., in seconds or tenths of a second, and will also express in written text an assessment or evaluation of the reaction ability of the test person, as in the illustrated case.

25 The various parts of the automatic testing apparatus, i.e. the test plane 12 with lamps 14-44, the operating panel and the operating buttons 46-60, and the measuring and indicating devices or the scale 60 are all connected together by  
30 means of known electrical components such that the testing apparatus will have the following method of operation: The lamps 14-44 are randomly ignited and extinguished over the whole of the test plane 12, wherewith subsequent to the passag of an indefinite tim period, one of the lamps  
35 14-44 will remain illuminated while the others are extinguished, this time period constantly varying with each test

run. The lamp which remains ignited may thus be any one of the sixteen lamps 14-44; e.g. lamp 24, connected to the operating buttons 48 and 56 by respective electrical conductors, as illustrated in Figure 2. The test person will then localize the still ignited lamp 24 on the test plane 12 and as quickly as possible press the buttons 48, 56 associated with the lamp 24. In this respect, the lamps 14-44 and the buttons 46-60 are connected to the measuring and indicating devices 62 such that measurement of the reaction time will begin as soon as the single lamp 24 remains ignited, as in the described case, and stops when the two buttons 48 and 46 connected to the conductors which connects the lamp 24 are pressed.

It will be understood from the foregoing, that the described automated test apparatus will reproduce, e.g., a traffic situation in a more realistic manner, owing to the complex situation to which the test person is asked to react. In addition to being expected to react to a situation in which only a single lamp remains ignited (or optionally extinguished) the test person is also required to localize this single lamp on the test plane, said lamp being only one of a large number of lamps, in the illustrated embodiment sixteen lamps. When the correct lamp has been localized, the corresponding two operating buttons must also be localized and pressed, before the reaction measuring arrangement will stop. Thus, the test person must be capable of assessing the situation very quickly and must have good coordination in order to achieve a short reaction time. This corresponds quite well with those situations likely to occur, for instance, in present day road traffic.

Although the aforescribed exemplifying embodiment of the inventive apparatus is shown to include sixteen lamps together with a corresponding number of operating buttons, it will be understood that this number can be varied within

the scope of the invention, and may be greater or smaller than the illustrated number, depending upon the intended use of the apparatus. Tests have shown that sixteen lamps is a number which can be managed by an average test person within a reasonable reaction time. The test devices of the illustrated embodiment have the form of lamps or light nodes, although it will be understood that other test devices whose state can be changed in a manner discernible to the test person, either visually and/or audibly, such as movable figures or like devices, can be used in the inventive apparatus. Although the illustrated and described testing apparatus is operated electrically, it will be understood that the apparatus may alternatively be operated pneumatically and mechanically, if considered suitable.

For practical purposes, the illustrated automatic apparatus is provided with a coin-operated starting arrangement 65 (Fig. 1), although it will be understood that the apparatus may, alternatively, be started by means of a separate button, or by a combination of coin-slot and start button.

The aforescribed and illustrated embodiment merely exemplifies one way of realizing the invention, and is not to be considered restrictive of the scope of the invention.

CLAIMS

1. Apparatus for testing or measuring the reaction rate of a person, comprising reaction promoting devices whose state is intended to change at random; operating means for activation by said person upon the occurrence of a change of state to which said person is intended to react; and reaction time measuring and indicating means connected to the operating means, characterized in that the apparatus further comprises a plurality of test devices (14-44) each of which is connected to at least two operating devices (46-60) in a manner such that both of said operating devices must be activated in order to activate the measuring and indicating devices (62) when the pre-determined state of the test devices occurs.

2. Apparatus according to Claim 1, characterized in that the test devices have the form of light emitting devices, such as lamps (14-44) which are ignited or extinguished randomly.

3. Apparatus according to Claim 2, characterized in that the pre-determined state is a sustained ignited state of a single lamp (14-44) with the remaining lamps extinguished.

4. Apparatus according to Claim 2 or 3, characterized in that the light emitting devices are arranged in a regular pattern and are connected with the operating devices (46-60) by means of an electric, pneumatic or mechanical conductor network.

5. Apparatus according to any of Claims 1-4, characterized in that the test devices (14-44) are six in number and the operating devices (46-60) are eight in number.



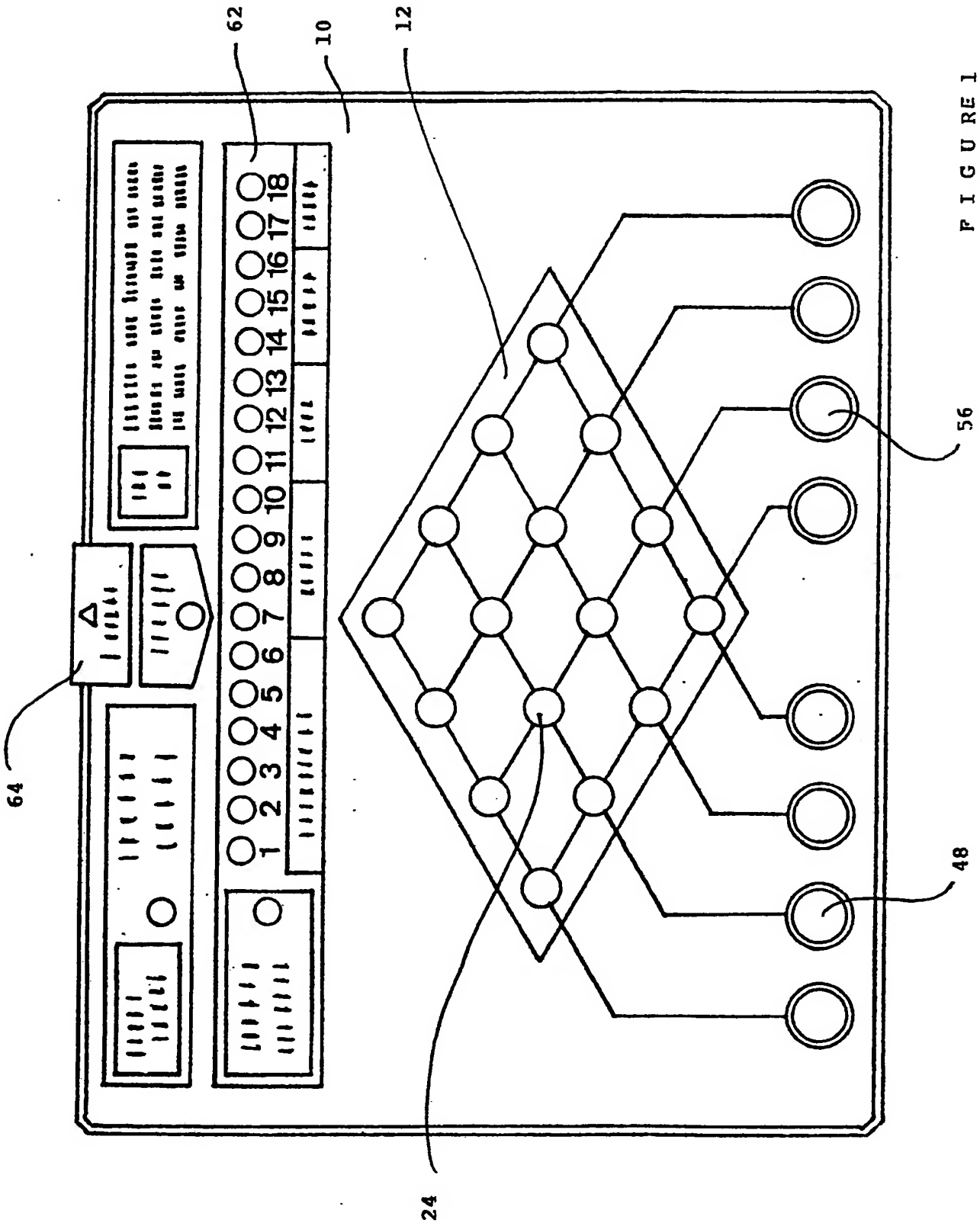
6. Apparatus according to Claim 5, characterized in that the test devices (14-44) are connected in groups of four to a respective operating device (46-60) in two mutually intersecting coupling networks.

7. Apparatus according to any of Claims 1-6, characterized in that the test devices (14-44) are arranged in uniform spaced relationship to form a rhombic field (12).

8. Apparatus according to Claim 7, characterized in that the operating devices are in the form of buttons which are located beneath said field (12) and which are arranged in two groups each containing four buttons (46-52; 54-60).

9. Apparatus according to any of Claims 1-8, characterized in that the apparatus includes a coin-operated starting arrangement (64).

10. Apparatus according to any of Claims 1-9, characterized by a measuring and indicating reaction scale (62) for indicating the reaction time achieved.



SUBSTITUTE SHEET

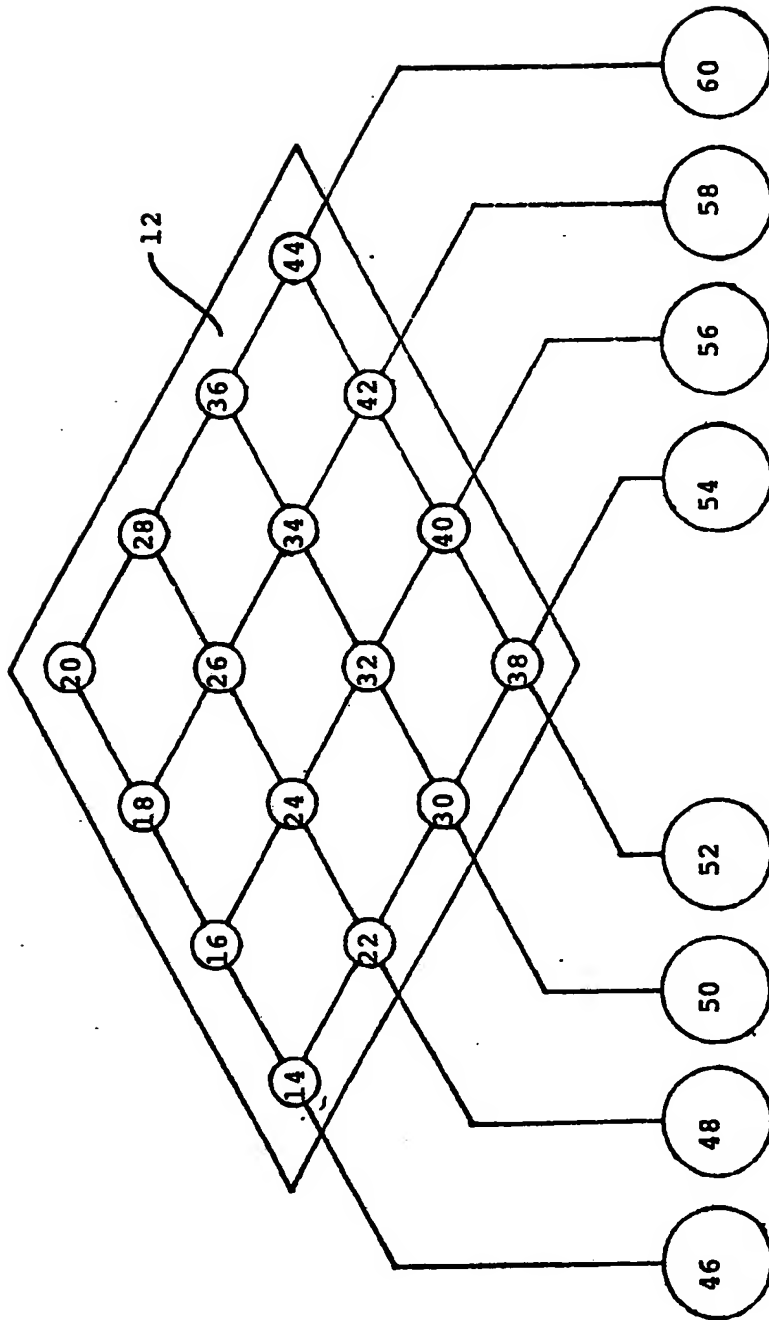


FIGURE 2

# INTERNATIONAL SEARCH REPORT

International Application No PCT/SE88/00425

<b>I. CLASSIFICATION OF SUBJECT MATTER</b> (if several classification symbols apply, indicate all) *		
According to International Patent Classification (IPC) or to both National Classification and IPC		
4		
A 61 B 5/16		
<b>II. FIELDS SEARCHED</b>		
Minimum Documentation Searched *		
Classification System	Classification Symbols	
IPC 4	A 61 B 5/16	
US C1	128:740-745, 273:1, 35:8, 434:258-261	
Documentation Searched other than Minimum Documentation to the extent that such Documents are included in the Fields Searched *		
SE, NO, DK, FI classes as above		
<b>III. DOCUMENTS CONSIDERED TO BE RELEVANT</b> *		
Category *	Citation of Document, ** with indication, where appropriate, of the relevant passages **	Relevant to Claim No. **
A	US, A, 1 937 445(F C SMITH) 28 November 1933	1-10
A	US, A, 2 984 017(A G S PASK) 16 May 1961	1-10
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<b>IV. CERTIFICATION</b>		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
1988-11-04	1988 -11- 11	
International Searching Authority	Signature of Authorized Officer:	
Swedish Patent Office	And rs Holmberg	